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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/773,516	02/05/2004	Frederick M. Mako	MAKO-12 CONT	6541

7590 07/29/2008

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EXAMINER	
MAYES, MELVIN C	

ART UNIT	PAPER NUMBER
1791	

MAIL DATE	DELIVERY MODE
07/29/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/773,516	MAKO ET AL.	
	Examiner	Art Unit	
	Melvin C. Mayes	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 July 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *9-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

(1)

A request for continued examination under 37 CFR 1.114 was filed in this application after appeal to the Board of Patent Appeals and Interferences, but prior to a decision on the appeal. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on July 3, 2008 has been entered.

Claim Rejections - 35 USC § 102

(2)

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(3)

Claim 9 is rejected under 35 U.S.C. 102(b) as being anticipated by JP 63-129078.

JP 63-129078 discloses a method of joining non-oxide ceramic tubes comprising:

providing a first non-oxide ceramic tube A (cylindrical body) having a tapered area and a second non-oxide ceramic tube B (cylindrical body) having a tapered area;

aligning the tapered areas of the first and second tubes so that they are in contact;

applying a suspension (slurry) of metal Si powder to the tapered areas of the ceramic tubes; and

heating the tubes with the slurry at a temperature of 1400°C to join the tubes (Abstract, page 2 and Fig. 1 (b)).

(4)

Claim 9 is rejected under 35 U.S.C. 102(b) as being anticipated by JP 57-67083.

JP 57-67083 discloses a method of joining non-oxide ceramic tubes comprising:

providing a first non-oxide ceramic tube 1 (cylindrical body) having a tapered area, a second non-oxide ceramic tube 2 (cylindrical body) having a tapered area and a third non-oxide ceramic tube 3 (cylindrical body) having a tapered area;

aligning the tapered areas of the first and second tubes so that they are in contact and surrounding the first and second tubes with the third tube;

inserting a refractory material of silicone polymer and carbide powder between the third tube and the other tubes (thus applying a slurry to the tapered areas of the cylindrical bodies); and

heating the tubes at a temperature of 1200-1800°C (overlapping the claimed range of 850°C to 1400°C) (Abstract, Fig. 1(F), oral translation).

Claim Rejections - 35 USC § 103

(5)

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

(6)

Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 6-256067 in view of DiChiara, Jr. 6,494,979.

JP 6-256067 (JP '067) discloses a method of joining ceramic products comprising:

providing a slurry of polysilazane compound, polycarbosilane compound and ceramic powder of the same type as the products to be joined;

applying the slurry to the end faces of two ceramic products to be joined;

gluing the end faces together; and

calcinating (heating) at temperature of 1200°C to maximize bending strength (translation). JP '067 discloses that the method can be used to form integrated ceramics of complex shapes and large objects through firmly fixed joints and in the Examples sets forth that the type of ceramic products to be joined can be sticks having a diameter (thus cylindrical bodies) (translation, pages 1-12). JP 6-256067 does not disclose providing the end faces of the stick (cylindrical bodies) to which the slurry is applied as tapered.

DiChiara, Jr. teaches that in bonding ceramic members at their end portions using a ceramic binder, the end portions are provided as mitered so that the mating surfaces are angled with respect to the exterior surfaces of the members to increase the surface area of the joint as compared to a conventional butt joint to increase the strength in the area of the joint (col. 5, lines 29-36).

It would have been obvious to one of ordinary skill in the art to have modified the method of JP '067 for bonding two ceramic cylindrical bodies at their end faces by providing the end faces as mitered (tapered), as taught by DiChiara, Jr., to increase the surface area of the joint

compared to a conventional butt joint to increase the strength in the area of the joint bonded by ceramic. Providing the end faces of the two cylindrical bodies as mitered, and thus each having a tapered area, would have been obvious to one of ordinary skill in the art to increase the strength of the joint between the bodies by increasing the surface area of the joint, as taught by DiChiara, Jr.

Regarding Claim 10 and 11, JP 6-256067 discloses bonding silicon carbide products by providing in the slurry silicon carbide powder of mean particle diameter of 2 microns, thus the slurry applied to the end faces includes silicon carbide powder having particle size in the range between 20 nm and 35 microns, as claimed in Claim 10, and includes silicon carbide powder having at least two distinct particles sizes, as claimed in Claim 11, since a mean particle size of 2 microns implies that there is a range of particle sizes, the mean size of which is 2 microns.

Response to Arguments

(5)

Applicant's arguments filed July 3, 2008 have been fully considered but they are not persuasive.

Applicant argues that joint strength is determined by the joint thickness and the thinner the joint, the stronger the joint is. Applicant compares joining cylinders having constant diameter with cylinders having variable diameter. Applicant argues that tapering is the key feature that controls one of the most important properties of ceramic to ceramic joint, namely, joint thickness and hence joint strength.

(6)

Applicant's arguments are not convincing. First, the claims are not limited to joining cylinders having "variable diameter," as argued. Second, Applicant states that "the taper angles may vary from 5-10 degrees, the only restriction is that the male taper must have a shallower angle than the female taper." This is not claimed, particularly that the male taper **must** have a shallower angle than the female taper, which implies that this relationship is required for the increased joint strength being argued. With respect to angles of 5-10 degrees, the only description with respect to particular taper angles is that "the collar 14 is machined with an inner taper that is 2 degrees halfway through on both ends of the collar 14 and the tubes are machined with outer tapers that are 1 degree at the ends that are intended to be joined." Third, comparison of results of two different joining methods must be submitted by Declaration or Affidavit.

With respect to tapering being a key feature to control joint thickness, the present specification does set forth that the "inclusion of capture tapers (FIG. 2) in the creation of the joint facilitates stronger joints by allowing the application of an appropriate thin coating of slurry 12." This type of capture tapering wherein the taper of the interior body is at a lesser angle than the taper of the exterior body is not claimed. Applicant only claims first and second cylindrical bodies each having a tapered area but does not claim any relationship with respect to the angles of the tapered areas nor that one body is an exterior body while the other is an interior body. The Examiner would also like to point out that the present specification sets forth "alignment tapering" which does not appear to be necessarily the same as the disclosed capture tapering. The claimed "tapered area" could relate to either capture tapering, the disclosed alignment tapering

or, giving the claim its broadest reasonable interpretation, any type of tapering of an area of the cylindrical bodies.

The claims broadly claim "tapered area of first cylindrical body" and "tapered area of second cylindrical body." As set forth in the rejections, JP 57-67083 and JP 63-129078 each disclose bonding two non-oxide ceramic cylindrical bodies having tapered areas, and JP 57-67083 also discloses providing both the tubes and the collar with tapered areas. DiChiara, Jr. suggests providing the end faces of the two ceramic cylindrical bodies as tapered to increase the strength of the joint between the bars by increasing the surface area of the joint.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin C. Mayes whose telephone number is 571-272-1234. The examiner can normally be reached on Mon-Fri 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Phillip C. Tucker can be reached on 571-272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Melvin C. Mayes
Primary Examiner
Art Unit 1791

MCM
July 27, 2008

/Melvin C. Mayes/
Primary Examiner, Art Unit 1791